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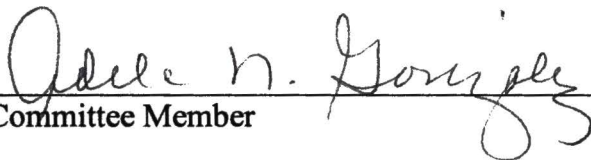
A competent, well-trained public health workforce is central to a public health agency's ability to respond to a public health emergency. A first step in developing a training curriculum is to assess training needs. This study sought to find correlations between perceived competence in the nine public health preparedness core competency and demographic information by performing an analysis on secondary data. This study found hours training, gender, education level to be most positively associated with a higher confidence level. Future studies should explore more accurate ways of accessing actual competence levels.

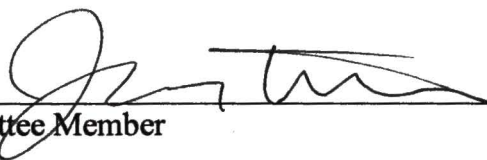
PUBLIC HEALTH PREPAREDNESS WORKFORCE CORE
COMPETENCIES AND RELATED
WORKFORCE CHARACTERISTICS OF A LOCAL HEALTH DEPARTMENT
IN NORTH TEXAS

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**Public Health Preparedness Workforce Core Competencies and Related
Workforce Characteristics of a Local Health Department
in North Texas**

THESIS

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CHAPTER 1

INTRODUCTION

The face of public health forever changed in the Fall of 2001 when terrorists used the biological agent *Bacillus anthracis* (Anthrax) as a weapon. Following the Anthrax incidents on the Eastern seaboard, the public health community changed the way it thought about plans for emergency response (Kerby et al., 2005). Following these attacks, the Centers for Disease Control and Prevention (CDC) “awarded an unprecedented level of funding to state and local health departments through cooperative agreements” (Clements-Nolle et al., 2005) to improve the public health infrastructure and better prepare the public health community to respond to bioterrorism and public health threats. In the State of Texas, these cooperative agreements were administered through the Texas Department of State Health Services (formally the Texas Department of Health). Until fiscal year 2005 the cooperative agreements addressed six areas: preparedness planning and readiness assessment; epidemiology and surveillance; laboratory capacity; communications and information technology; risk communication and public information dissemination; and education and training.

“State and local health departments across the nation have been tasked with ensuring that their local infrastructure is capable of detecting and appropriately

responding to a bioterrorism” (Clements-Nolle et al., 2005) event as well as naturally occurring disasters. Every disaster, either naturally occurring or manmade such as terrorism, has health consequences that require a public health response. Following the Anthrax incidents, the public health workforce became first responders, a major paradigm shift for many. Preparedness is now a public health priority, and the foundation of preparedness is a competent, well-trained workforce able to respond to an emergency. “Public health workers need to be able to identify their roles in emergencies and demonstrate competencies in basic public health emergency preparedness and response functions” (Estrada et al., 2005). The public health worker must also know how such activities fit into the agency’s emergency response plan (Estrada et al., 2005).

The first step in developing appropriate and effective training for a public health workforce is to assess the type and level of training needed. “The issue of workforce training and competency is central to the success of any public health system” (Institute of Medicine, 2003). “Public health agencies have a responsibility to identify the public health workforce needs within their jurisdictions” and develop training based on those needs (Institute of Medicine, 2003). Competencies in public health preparedness are especially important because such concepts are relatively new to many public health workers. Many public health agencies have relied solely on self-assessments to determine training needs which has raised questions over the reliability of the results. A more accurate way to determine training needs is to measure knowledge levels more directly through more focused questions. A more direct measure of knowledge level would allow for more focused, better developed training programs. It is also important to

determine training needs by discipline, professional category and the most appropriate modes of delivery.

Rationale

The purpose of this study was to describe local public health workers' perception of competency in 9 core areas of public health preparedness established by the Columbia School of Nursing and describe the correlation between that perception and a local public health workers' education level, years experience in public health, professional category, hours in the past 12 months spent in public health preparedness training and familiarity with the core competencies. This information was used in part by the Professional Development Coordinator at Tarrant County Public Health to develop more focused and appropriate training in public health preparedness.

Research Questions

The intent of the research was to quantify the local public health workers' perception competency in 9 core areas of public health preparedness. Additionally, the researchers sought to describe the correlation between level of competency and:

- education level;
- years experience in public health;
- professional category;
- hours in the past 12 months spent in public health preparedness training;
- and
- familiarity with the 9 core competencies

Delimitations

The researcher only collected data from a survey conducted at Tarrant County Public Health (TCPH) and consisting only of TCPH. This influenced the outcome because the perceptions of employees may not represent the perceptions of the public health workforce regionally, statewide or nationwide.

Limitations

There are several limitations to this study and were considered in the interpretation of the results. Secondary data were used for purposes of this study. Data were collected only from employees at Tarrant County Public Health. Each local public health agency has unique characteristics, thus results may or may not be generalizable to other local health departments. The results reflect descriptive statistics and thus simply reflect the current perceptions among the public health professionals being surveyed. The survey was conducted over a period of two weeks potentially excluding some staff who may not have the opportunity to participate due to being on leave, at training or otherwise unable to participate.

Assumptions

Assumptions in this study were that (1) all participants in the original study had access to a computer and possessed a level of computer literacy sufficient to access and complete an online survey; and (2) participants responded as honestly and objectively as possible.

CHAPTER 2

LITERATURE REVIEW

Recently, there has been a strong emphasis placed on public health workforce development (Bartee et al., 2003; Lichtveld & Cioffi, 2003; Dato, Potter & Fertman, 2001). A key step in the workforce development process is assessing the training needs of the public health workforce, especially in the area of public health preparedness (Harrison et al., 2005). Though much literature exists for workforce development assessment, there are relatively few studies that exist which assess workforce development needs in the realm of public health preparedness. Generally, those studies that have focused on assessing the training needs for preparedness have been conducted using self-assessment, providing results that do not necessarily provide the most accurate picture of training needs.

A well-prepared public health workforce is the cornerstone of improving the public health infrastructure (Lichtveld & Cioffi, 2003). Reports released by the Institute of Medicine (1988; 1997; 2003) have highlighted the shortcomings of workforce training. Such shortcomings hold especially true in light of a new national focus of public health preparedness for bioterrorism and other public health emergencies.

Like many other areas of public health, workforce development is historically under-funded (Lichtveld & Cioffi, 2003). Since 1998 funding for workforce development has increased “from under a million dollars (primarily from [Health Resources Service Administration] HRSA) in 1997 to more than \$25 million (mainly from CDC) in 2003 (Turnock 2003). In 2002, the Centers for Disease Control and Prevention (CDC) made workforce development and training one of the six “focus areas” in public health preparedness grants. In 2003, approximately \$90 million in additional funding was provided to state and local public health departments with around 10 percent of the funding being dedicated to workforce development (Turnock 2003).

Another issue cited in the literature is that of the composition of the public health workforce. “[T]he number of formally trained individuals entering into the public health workforces each year is very small compared with the overall number of public health workers” (Turnock, 2003) and relatively few report a formal graduate level public health education (Lichtveld & Cioffi, 2003). Many entering into the public health workforce have only training in the specific technical area such as health education or environmental health (Harrison et al., 2005). Technical expertise is critical, however a basic understanding of core public health competencies is also needed (Harrison et al., 2005). Such a lack of formal training does not “necessarily lead to the conclusion that public health workers are unprepared” (Turnock, 2003). The public health workforce is composed of workers with a variety of professional and academic backgrounds (Turnock, 2003). “On-the-job training and work experience contribute substantially to the overall competency and preparedness of the public health workforce” (Turnock, 2003). Public

health preparedness is now injected into the day-to-day public health responsibilities of all public health workers (Lichtveld, et al., 2003). Public health workers respond to many disasters such as earthquakes and floods which demonstrate skills in assessing needs and devising improvement plans (Turnock, 2003).

Terrorist activity on United States soil and other emerging public health threats have highlighted the need for public health professionals to possess the skills and competencies needed to respond to such public health threats (Bartee et al., 2003). Core competencies have been developed for public health workers both for public health as a whole and emergency preparedness (Turnock, 2003; Gebbie & Merrill, 2002; Harrison et al., 2005). Cited examples include a list of core public health competencies which are organized within the 10 essential public health service developed by the Council on Linkages between Academia and Public Health Practice (CLBAPHP) (Harrison et al., 2005). The Columbia University School of Nursing, Center for Health Policy developed a list of core public health worker competencies for emergency preparedness and response. This list includes 9 core competencies (Columbia University School of Nursing, Center for Health Policy, 2001):

1. Describe the public health role in emergency response in a range of emergencies that might arise.
2. Describe the chain of command in emergency response
3. Identify and locate the agency emergency response plan (or the pertinent portion of the plan).

4. Describe his/her functional role(s) in emergency response and demonstrate his/her role(s) in regular drills.
5. Demonstrate correct use of all communication equipment used for emergency communication (phone, fax, radio, etc.).
6. Describe communication role(s) in emergency response:
 - Within agency
 - Media
 - General public
 - Personal (family, neighbors)
7. Identify limits to own knowledge/skill/authority and identify key system resources for referring matters that exceed these limits.
8. Apply creative problem solving and flexible thinking to unusual challenges within his/her functional responsibilities and evaluate effectiveness of all actions taken.
9. Recognize deviations from the norm that might indicate an emergency and describe appropriate action

These core competencies serve as the foundation for workforce development assessments and surveys as well as other initiatives that aid public health departments in preparedness efforts.

Assessing the training needs of the public health worker is the first step toward providing appropriate training for specific areas such as emergency preparedness as well as the core competencies (Harrison et al., 2005; Potter et al., 2000; Kerby et al., 2005).

Relatively few studies exist that use core competencies as the basis for such assessments and only two studies found used the core competencies for emergency preparedness and response. Such studies are generally self-assessments which mast a statement and ask the public health worker to rate their knowledge, skills, levels of confidence, etc. using a Likert scale or similar methodology (Harrison et al., 2005; Potter et al., 2000; Kerby et al., 2005). One such study conducted by Bartee et al (2003) developed a survey based on the *Core Competencies for Public Health* that consisted of 91 questions divided into five sections addressing the eight major domains and their corresponding 68 competencies. The participants in the study “were asked to describe their perceived level of proficiency corresponding with each the competencies listed” by ranking their proficiency using a five-point Likert scale (Bartee et al., 2003). Descriptive statistics were calculated to identify primary need areas and specific competencies in which the public health professionals were highly proficient (Bartee et al., 2003). Results differed on each of the competencies based on the public health professional’s discipline (e.g., nursing, environmental health, etc.)

Two studies reviewed used the Ten Essential Public Health services as a basis for workforce development needs assessment. Chauvin, Anderson and Bowdish (2001) describe a survey administered to public health professionals in Alabama, Arkansas, Louisiana and Mississippi. Data was collected from a random sample representing 20 percent of the professional workforce in the 4 states. Harrison et al. (2005) describe the North Carolina Public Health Workforce Training needs assessment survey that was implemented through a collaboration between the several agencies with the purpose of

assessing state and local public health workers and providing training based on the results. The survey was designed to allow public health workers to self-assess their level of need for training in all core public health competencies and was organized by the ten essential services. Respondents used a scale of 1 (not important at all) to 4 (very important) to self assess the importance of each activity to his or her job then rate his or her personal need for training on each of those same activities, again using a scale of 1 (no need for training) to 4 (very high need for training) (Harrison et al., 2005). Questions on emergency preparedness and response were included in this survey based on the Columbia University School of Nursing Core Public Health Worker Competencies for Emergency Preparedness and Response. Emergency preparedness and response competencies included in the survey were presented in a “format similar to that of the core public health competencies, except that individuals were asked to rate their confidence to carry out the activity on a scale from 1 (not confident at all) to 4 (very confident)” (Harrison et al., 2005). The authors of this study note that based on their experience it is important to design a survey that easy to access and efficient. One initial barrier in the study was the time it took to complete the survey. To overcome this barrier, researchers made the survey available in an online format that could be completed in sections and that could be accessed multiple times and at any time. Another barrier addressed in the implementation of the online survey was that of computer access and literacy. To address this barrier, on-site assistance was provided to health departments; guidance to those completing the survey was also provided.

One of the more relevant studies conducted by Kerby et al. (2005) examined effective ways to evaluate public health workers' competence for preparedness. This study was conducted at Tarrant County Public Health, a local public health agency in Fort Worth, Texas. This local health department was the recipient of funding from the CDC cooperative agreement for public health preparedness and was a pilot site for the project Public Health Ready. This program is a "voluntary recognition program for local public health agencies that meet peer-developed criteria for public health preparedness" (Estrada et al., 2005). This program was developed through collaboration between the National Association of County and City Health Officials (NACCHO), Columbia University's Center for Health Policy and the CDC. One of the core areas of the program is workforce competency development (Estrada et al., 2005). Staff members at Tarrant County Public Health were surveyed to assess how confident they perceived themselves to be in responding to an emergency event and their perceived need for training in key competency areas (Kerby et al., 2005). The authors urge caution when interpreting the results of self-assessments. Results of the survey indicated a worker's rating of need for training may reflect an overall interest in training rather than an actual need for training in each area. Because a direct measure of knowledge was not taken, it is difficult to determine if the self-assessment of training needs is accurate. The authors in fact recommend avoiding the use of self-assessments. The authors however did not attempt to describe factors that may have been associated with such ratings. For example, if a respondent rated a 1 in ability to describe the chain of command, it may have been due to the fact they had no emergency preparedness training on the command structure. The

results of this study may have been more meaningful had the authors described the general characteristics of the workforce being surveyed. Such information would be valuable for determining training priorities. There are many factors that could have been associated with a particular rating. Knowing why the self-assessment yielded these results would be beneficial.

This study applied lessons learned from previous studies attempting to use core public health competencies as a means to assess the public health workforce. This study will use an online survey instrument that is easily accessible using limited human resources to tabulate the results. Like previous studies, answers will be based on a simple 4 point Likert scale. Unlike previous studies, this study will attempt to describe associations between ratings and demographic characteristics such as education level, experience and gender. Such information may provide a better understanding of what may influence a perceived level of competence allowing for better focused training.

CHAPTER 3

METHODOLOGY

Population and Sample

Original data was collected via SurveyMonkey, an online survey that was made available for access by all employees at Tarrant County Public Health (TCPH) in Fort Worth, Texas. TCPH serves a population of over 1.5 million in a county of 41 jurisdictions including two large cities; Fort Worth and Arlington as well as a major transportation hub – the Dallas / Fort Worth International Airport which is the third busiest airport in the United States. At the time of the survey, TCPH employed 329 full and part time staff members. TCPH is a Project Public Health Ready certified site, houses the Southwest Center for Advanced Practice and the recipient of funding through a Center for Disease Control and Preventions Cooperative Agreement on Public Health Preparedness and Response for Bioterrorism. Such characteristics offer a multitude of resources for professional workforce development.

All 329 employees of Tarrant County Public Health were eligible and encouraged to participate in the original study, although participation was completely voluntary. All employees at Tarrant County Public Health were 18 years of age and older and came from various backgrounds, education levels, and ethnicities. All employees were

recruited to participate in the original study by the Professional Development Coordinator at Tarrant County Public Health. There were no incentives offered for participation in the original study and no penalties for non-participation.

Protection of Human Participants

This study involved secondary data analysis from a de-identified data set. The original study was non-invasive and the survey instrument was completely voluntary. No identifying information was provided to the researcher, thus no special precautions were required. Methods for this research were approved by the Institutional Review Board at the University of North Texas Health Science Center (UNTHSC). All research methods were in accordance to rules and regulations as presented in UNTHSC Health Insurance Portability and Accountability Act (HIPPA) training.

Data Collection Procedures

This study involved secondary data collection from a survey developed and administered by Tarrant County Public Health. Original data was collected via SurveyMonkey, an online survey service. The survey was available for access for a period of 14 days. Employees were notified of the survey via department-wide e-mail. Although participation was completely voluntary, all employees were encouraged to participate by stressing the importance of better developed training. Division managers and supervisors were encouraged to discuss the survey with their employees and to allow their employees time and access to a computer to complete the survey. All surveys were confidential and no unique identifiers were assigned to surveys. All employees at Tarrant County Public Health had access to a computer while at work.

Included in the analysis for this study are data from those questions on demographic information (professional background, educational background, gender and age) and those related to level of confidence in the nine Public Health Preparedness Core Competencies. Additionally, information on number of hours spent in public health preparedness training and years experience in public health were included in the analysis.

Instrumentation

The original survey instrument consisted of 37 items relating to the 9 public health preparedness core competencies established by the Columbia School of Nursing Center for Health Policy. Data from only 33 of the questions were used for purposes of this study. The survey asked the participant to rate their level of confidence in being able to perform a task related to a core competency 1 to 4 (1 = not confident at all, 2 = somewhat confident, 3 = confident and 4 = very confident). The respondent was able to choose their response from a drop-down menu. Additionally, participants were asked to rate their need for training for each statement, however results from these questions are not included in this analysis.

Unlike previous studies reviewed, the survey instrument did not state the core competencies verbatim. Rather, the core competencies were broken into statements the respondent could more easily understand and that would be more useful in determining training needs. Questions from the survey included in this analysis are presented in Appendix A.

This survey was developed by the Professional Development Coordinator and the public health preparedness staff at Tarrant County Public Health. This survey was

reviewed by other professionals involved in public health preparedness from other local health departments

Statistical Analysis

The data were analyzed using SPSS version 12.0. Mean ratings were computed for perceived confidence that the statement could be achieved. Correlational analysis was conducted to compare confidence rating for each of the statements and professional category, gender, age range, education level and years experience.

Mean rating for responses to each of the statements were calculated by assigning a numeric value for each of the responses (1 = not confident at all, 2 = somewhat confident, 3 = confident and 4 = very confident) and are presented in Table 1. Because this was a descriptive study, no substitutions were made for missing data.

For some of the core competencies, multiple there were multiple questions asked to better measure specific training needs. For instance, core competency 2 (Describe the chain of command in emergency response) was broken into two questions; one regarding the incident command system (ICS) in general and one regarding the chain of command with TCPH. If more than one question was included for each competency, the mean rating for each question was combined for a new mean rating. Questions containing multiple responses (questions 7, 8 and 12) were combined and averaged. Recalculated mean ratings for each of the 9 core competencies are presented in Table 2.

Because this was ranked data with a small sample size, Spearman's rho correlation coefficient was used to look for associations between the variables professional category, education level, years experience, gender, age group, hours

training, familiarity with the public health preparedness core competencies and the respondent's rating for confidence to each of the statements.

CHAPTER 4

RESULTS

There were a total of 81 respondents for a response rate of 24%. Most respondents identified themselves as administrative support or nursing staff. Four respondents selected other as their professional category, however after review of their job title and description, those responses were re-classified into administrative support (2), training/health educator (1), and policy/planner (1). Table 3 presents demographic information on the respondents. Table 5 presents the number of respondents compared to actual staff. A slightly higher proportion of nurses responded to the survey compared to the actual proportion currently employed and a slightly lower proportion of administrative supportive staff responded compared to the proportion currently employed. These proportions may have had some effect on the outcomes. However, when completing the correlation analysis between demographics and confidence level, professional category was found not to be a significant correlation.

Most respondents held a bachelors degree or higher, were 45-54 years of age, have had 5 or more hours of emergency preparedness training in the past 12 months and were familiar with the public health preparedness core competencies. A majority of the

respondents were female (78.8%), however there appears to be no selection bias according to gender. Selection bias was checked for using the following method:

$$p^{\text{males}} = 17/59 = 0.29, p^{\text{females}} = 63/271 = 0.23$$

$$p = x1 + x2 / n1 + n2 = 81 / 329 = 0.24$$

$$\hat{\sigma} = \sqrt{p(1-p) / n1 + p(1-p) / n2} = 0.06$$

$$z = (p^{\text{males}} - p^{\text{females}}) / \hat{\sigma} = 0.29 - 0.23 / 0.06 = 0.974$$

To be significant z would be 1.96 or greater standard deviations, thus there was not significant selection bias.

Data were missing for at least one variable or more for each respondent. As Table 2 shows, questions toward the end of the survey tended to be skipped more frequently. For example, the last question regarding hours of training was skipped 10 times, whereas question 2 regarding education level was skipped only once. This would suggest the survey may have included too many questions or the respondent lost interest in the survey.

Respondents were more confident they could describe their department's role than they could describe Tarrant County Public Health's (TCPH) role. Respondents were quite confident they could use everyday communications equipment such as land-line and cellular phones as well as facsimile machines. However, respondents were much less confident they could use devices such as HAM radios, Blackberries, satellite radios or video-conferencing equipment. Surprisingly, respondents were only somewhat confident they could recognize biological, chemical and radiological and wide-spread

communicable disease outbreaks. Confidence levels for this category were only slightly higher among epidemiology, administrator/manager/supervisor and environmental staff. Not surprisingly however, the physician rated very confident to this category. Respondents were most confident they could recognize more common, natural events such as floods and tornados. A question asked in this survey, but not included in this study, asked the respondent if they were not at all confident, what the reason was they could recognize such events. Most responded it was a lack of training and / or lack of knowledge.

As shown in Table 2, mean ratings for confidence in the core competencies were generally low in the somewhat confident (2) range. This rating is lower than a previous study conducted 3 years earlier where mean ratings were in the confident (3) range. Administrative support staff, those with a high school diploma and females tended to respond with the lowest confidence ratings. Those who responded in the professional category Administrator/Director/Manager/Supervisor and physician, with masters degrees and higher, and males tended to respond with the highest confidence ratings.

Table 4 presents significant correlations between the core competencies and demographic information. The most significant correlations were familiarity with the core competencies and hours training. In general, as hours training, age, education level and years experience increased, level of confidence also increased. Additionally, males tended to have a higher level of confidence. Hours training was positively correlated with all but one of the core competencies. Familiarity and gender were correlated to five

of the competencies, education level was correlated to four of the competencies and years experience and age were correlated to two of the competencies.

Summary

Respondents were only somewhat confident for each of the core competencies. There was no selection bias according to gender, however a higher proportion of nurses and administrative staff responded. Hours training, familiarity with the core competencies tended to be most highly correlated with a high level of confidence. Higher education level, age, years experience and being male were also correlated with higher confidence, but were less significant.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Summary

Preparedness is a relatively new concept to public health in general. Thus, competencies in public health preparedness are especially important because such concepts are new to many public health workers. The objective of this study was to describe the public health worker's current perception of confidence in the Nine Public Health Preparedness Core Competencies (Columbia School of Nursing, Center for Health Policy, 2006). This objective was accomplished through the analysis of secondary data collected from a survey conducted at Tarrant County Public Health in late 2005.

Conclusion

Overall, employees at Tarrant County Public Health (TCPH) are only somewhat confident in the nine public health preparedness core competencies. Confidence levels are most significantly positively correlated with hours training and familiarity with the nine core competencies. A less significant correlation was found between age, education level, gender, years experience and the core competencies. Professional category was not found to be significantly correlated with level of confidence.

Discussion and Implications

Generally, this study yielded much lower levels of confidence than expected with an average rating of 2 – Somewhat Confident. In a study conducted by Kerby et al (2005) at Tarrant County Public Health (TCPH) three years previous, the mean confidence ratings were higher, with an average rating of 3 - Confident. Kerby et al (2005) had 265 responses with an unspecified response rate, whereas this study included only 81 responses with a 24% response rate. It is unclear as to why there was a lower response rate in this study. All public health staff were reminded via e-mail to respond to the survey and supervisors were to encourage staff to participate. However, during the Kerby study, respondents were met with individually and in groups to go over the survey. The study by Kerby et al. (2005) was conducted just after TCPH received Public Health Ready certification which may account for higher confidence ratings.

Questions toward the end of the survey were skipped more frequently than questions at the beginning of the survey. This would suggest that perhaps the survey was too long or the respondent lost interest in completing the survey.

Questions included in the survey were open to interpretation and subjective. A respondent's perceived level of confidence may not actually reflect their actual level of ability. As with other studies of similar nature, caution should be used when interpreting the results of a self-assessment. A more accurate way to measure level of competence may be through observation of performance in drills, exercises (Morse, 2003; Kerby et al., 2005) or in response to actual events.

The objective of this study was merely to describe the perceived level of confidence and correlations between that level of confidence and some demographic information. The conclusions in this study are not necessarily predictors of confidence level. There are undoubtedly many other factors which may contribute to level of confidence including but not limited to race, years employed at TCPH and involvement in response to actual disasters or emergencies.

This study does suggest that while a tremendous amount of time and resources (both human and financial) have been directed toward training in the past several years, the workforce at TCPH remains unconfident they are prepared for a public health emergency. Most concerning is a low level of confidence in being able to recognize a possible emergency. With the threat of emerging infectious diseases and possible influenza pandemic, a low level of confidence in being able to recognize a wide-spread communicable disease could be of major concern. Even though a higher number of hours spent in training is correlated with a higher level of confidence, the content of the training is questionable because of an overall low level of confidence.

Recommendations

A confident and competent public health workforce is vital to a successful response to a public health emergency. A public health agency should continually evaluate its workforce as an indicator of overall preparedness. Quality over quantity should be evaluated when developing a public health preparedness training curriculum. This study finds professional category has little bearing on level of confidence, thus perhaps a standard curriculum should be developed for all public health staff.

Because self-assessment may not be the most accurate way of measuring levels of competence, future studies should be more performance based. Such performance measures could be collected through drills, table-top and full-scale exercises or in response to actual emergencies. This type of training may be of more interest to public health staff. One of the questions included in the survey asked the respondent what type of training they were most interested in. Over 50% responded they would be most interested in table-top or full scale exercises.

New and innovative methods should be explored to access the public health workforce. Numerous studies which include surveys note low response rates. Other local public health departments should conduct assessments and share results and methods. This would contribute to the advancement of workforce development and the sharing of best practices.

As mentioned, an unprecedented amount of financial resources are being made available to public health agencies to prepare for emergencies, to include training a more competent workforce. Even with such funding, this study finds little progress has been made based on self-perception. Recipients of funding should be held accountable and should comply to certain performance measures. At the time of this study, there was a lack of an adequate, accurate and public health specific tool measure a public health agency's preparedness level. Granting agencies should consider development of such a tool as a means to ensure monies are being used in an effective manner.

APPENDIX A

QUESTIONS FROM SURVEY INCLUDED IN THIS STUDY

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QUESTIONS FROM SURVEY INCLUDED IN THIS STUDY

Individuals were asked to rate their perceived competence on a scale of 1 to 4 (1 = not confident at all, 2 = somewhat confident, 3 = confident and 4 = very confident) in being able to perform the following tasks:

1. I am able to describe Tarrant County Public Health's (TCPH) role in emergency response in a range of emergencies that might arise
2. I am able to describe my department's role in emergency response
3. I am able to describe the chain of command in emergency response using the Incident Command System (ICS)
4. I am able to describe the chain of command within TCPH in emergency response
5. I am able to identify and locate the TCPH emergency response plan
6. I am able to describe the function/role(s) I would perform in response to an emergency (e.g., my role in an emergency is to provide patient care)
7. I am able to demonstrate correct use of the following communications equipment that may be used in emergency communications;
 - a. Phone (land-line and cell)
 - b. Blackberry
 - c. Fax
 - d. Ham Radio
 - e. Satellite Radio
 - f. Video-Conferencing Equipment

- g. Conference Calling
8. I am able to describe communication roles in emergency response
 - a. Within TCPH using established communications systems
 - b. With the media (specifically do you know the procedure for handling media inquiries?)
 - c. With the general public
 - d. Personal (with family, neighbors, etc.)
 9. I am able to know how and to who to refer matters that exceed my own knowledge/skill/authority (e.g., I would direct questions regarding medication to medical staff)
 10. I am able to respond to unusual challenges in response to an emergency event
 11. I am able to evaluate effectiveness of all actions taken.
 12. I am able to recognize unusual events that might indicate an emergency and describe appropriate actions for the following events;
 - a. Biological (e.g., Anthrax, Plague, Smallpox, etc.)
 - b. Chemical (e.g., Sarin, Ricin, Mustard Gas)
 - c. Radiological (e.g. dirty bomb)
 - d. Wide-spread communicable disease outbreak (e.g. Avian Flu, SARS)
 - e. Natural Hazards (e.g., tornados, floods, hurricanes)
 - f. Technological Hazards (e.g., hazardous materials, household chemical emergencies)

Respondents were also asked to provide the following demographic information:

1. Please check the box that most accurately reflects your primary job function(s) for your current position
 - a. Administrative Support Staff (e.g., accounting, administrative assistant, general office clerk, etc.)
 - b. Administrator/Director/Manager/Supervisor
 - c. Computer/Technology Specialist/IT Support
 - d. Dietician/Nutritionist
 - e. Environmental Health Professional (e.g., sanitarian, food safety professional, hazardous substance professional, toxicologist, etc.)
 - f. Epidemiologist/Surveillance Staff
 - g. Training/Health Educator
 - h. Laboratory Professional/Technician
 - i. Nurse
 - j. Physician
 - k. Policy/Planner
 - l. Public Relations/Media Specialist
 - m. Other
2. Please check the box that reflects your level of education:
 - a. High School Diploma or ED
 - b. Associates Degree
 - c. Bachelors Degree
 - d. Masters Degree

- e. Doctoral Degree
 - f. Professional Degree (MD, DO, JD)
3. How many years have you been working in public health?
4. Please select your gender
- a. Male
 - b. Female
5. Please select box of your appropriate age range
- a. 24 years of younger
 - b. 25-34
 - c. 35-44
 - d. 45-54
 - e. 55 years of above
6. Are you familiar with the Emergency Preparedness Core Competencies for all Public Health Workers?
- a. Yes
 - b. No

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Table 1. Mean Ratings for Survey Questions.

<u>Question</u>	<u>Mean Rating</u>	<u>Standard Deviation</u>
I am able to describe Tarrant County Public Health's (TCPH) role in emergency response in a range of emergencies that might arise.	2.38 (n=77)	0.80
I am able to describe my department's role in emergency response.	2.55 (n=77)	0.89
I am able to describe the chain of command in emergency response using the Incident Command System (ICS).	2.43 (n=77)	0.93
I am able to describe the chain of command within TCPH in emergency response.	2.30 (n=77)	0.80
I am able to identify and locate the TCPH emergency response plan.	2.29 (n=75)	1.80
I am able to describe the function/role(s) I would perform in response to an emergency (e.g. my role in an emergency is to provide patient care).	2.33 (n=75)	1.06
I am able to demonstrate the correct use of the following communications equipment that may be used in emergency communications;		
Phone (land-line and cell)	3.47 (n=75)	0.78
Blackberry	1.85 (n=75)	1.06
Fax	3.48 (n=75)	0.78
HAM Radio	1.27 (n=75)	0.58
Satellite Radio	1.24 (n=75)	0.59
Video-Conferencing Equipment	1.65 (n=75)	0.57
Conference Calling	2.35 (n=75)	0.72

Table 1 continued.

I am able to describe communication roles in emergency response;

Within TCPH using established communications systems	2.26 (n=74)	0.83
With the media (specifically do you know the procedure for handling media inquiries?)	2.50 (n=74)	0.92
With the general public	2.45 (n=74)	0.88
Personal (with family, neighbors, etc.)	2.85 (n=74)	1.08

I am able to know how and to who to refer matters that exceed my own knowledge/skills authority (e.g., I would direct questions regarding medication to medical staff).

2.96 (n=74) 0.83

I am able to respond to unusual challenges in response to an emergency event

2.41(n=74) 0.90

I am able to evaluate the effectiveness of all actions taken

2.12 (n=74) 0.94

I am able to recognize unusual event that might indicate an emergency;

Biological (e.g. Anthrax, Plague, Smallpox, etc.)	2.01 (n=72)	0.87
Chemical (e.g. Sarin, Ricin, Mustard Gas)	1.81 (n=72)	0.81
Radiological (e.g. dirty bomb)	1.69 (n=72)	0.86
Wide-spread communicable disease outbreak (e.g. Avian Flu, SARS)	2.11 (n=72)	0.80
Natural Hazards (e.g. tornados, floods, hurricanes)	2.57 (n=72)	0.80
Technological (e.g. hazardous materials, household chemical emergencies).	2.00 (n=72)	0.94

Table 2. Mean Ratings for Core Competencies.

<u>Competency</u>	<u>Mean Rating</u>	<u>Standard Deviation</u>
Describe the public health role in emergency response in a range of emergencies that might arise	2.5	0.77
Describe the chain of command in emergency response	2.4	0.79
Identify and locate the agency emergency response plan (or the pertinent portion of the plan).	2.3	1.08
Describe his/her functional role(s) in emergency response and demonstrate his/her role(s) in regular drills.	2.3	1.06
Demonstrate correct use of all communication equipment used for emergency communication (phone, fax, radio, etc.).	2.2	0.46
Describe communication role(s) in emergency response: <ul style="list-style-type: none"> • Within agency • Media • General public • Personal (family, neighbors) 	2.5	0.73
Identify limits to own knowledge/skill/authority and identify key system resources for referring matters that exceed these limits.	3.0	0.94
Apply creative problem solving and flexible thinking to unusual challenges within his/her functional responsibilities and evaluate effectiveness of all actions taken	2.3	0.77
Recognize deviations from the norm that might indicate an emergency and describe appropriate action	2.0	0.70

Table 3. Demographic Information.

Professional Category	
Administrative Support Staff	20
Administrator/Director/Manager/Supervisor	8
Computer/Technology Specialist/IT Support	2
Dietician/Nutritionist	3
Environmental Health Professional	5
Epidemiologist/Surveillance Staff	5
Training/Health Educator	5
Laboratory Professional/Technician	3
Nurse	19
Physician	1
Policy/Planner	3
Public Relations/Media Specialist	3
Other	4
Total Respondents	81
Skipped This Question	0
Gender	
Males	17
Females	63
Total	80
Skipped This Questions	1

Table 3 continued.

Education

High School Diploma or GED	17
Associates Degree	17
Bachelors Degree	26
Masters Degree	17
Doctoral Degree	1
Professional Degree (MD, DO, JD)	2
Total	80
Skipped This Question	1

Age

24 years or younger	2
25 - 34	14
35 - 44	17
45 - 54	29
55 years of above	17
Total	79
Skipped This Question	2

Hours Training

0	10
1	5
2	6
3	9
4	4
5 or more	37
Total	71
Skipped This Question	10

Table 3 continued.

Familiarity with competencies

Yes	50
No	28
Total	78
Skipped This Questions	3

Table 4. Correlations.

Competency:	Professional Category	Years Experience	Education Level	Gender	Age	Hours Training	Familiarity with Competencies
Describe the public health role in emergency response	.067	.165	.158	.333***	.082	.329**	.323**
Describe the chain of command	.001	.212	.185	.179	.175	.381**	.218
Identify and locate the agency emergency response plan	.038	.244*	.255*	.165	.088	.412**	.391**
Describe his/her functional role(s) in emergency response and demonstrate his/her role(s) in regular drills.	.108	.174	.179	.162	.008	.321**	.454**
Demonstrate correct use of all communication equipment used for emergency communication	.059	.075	.276*	.273*	.246*	.153	.025
Describe communication role(s) in emergency response	.127	.226	.280*	.258*	.270*	.340**	.270
Identify limits to own knowledge/skill/authority	.021	.233*	.086	.026	.084	.286*	.175
Apply creative problem solving and flexible thinking to unusual challenges within his/her functional responsibilities and evaluate effectiveness of all actions taken	.102	.191	.309**	.171	.009	.256*	.283*
Recognize deviations from the norm that might indicate an emergency and describe appropriate action	.201	.149	.372**	.334**	.109	.403**	.329**

**Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the .05 level (2-tailed)

Table 5. Response Rates by Professional Category.

Professional Category	<u>Survey</u>		<u>Actual</u>	
	n	% of total	n	% of total
Administrative Support Staff	20	24.7%	123	37.4%
Administrator/Director/Manager/Supervisor	8	9.9%	14	4.3%
Computer/Technology Specialist/IT Support	2	2.5%	4	1.2%
Dietician/Nutritionist	3	3.7%	38	11.6%
Environmental Health Professional	5	6.2%	22	6.7%
Epidemiologist/Surveillance Staff	5	6.2%	22	6.7%
Training/Health Educator	5	6.2%	32	9.7%
Laboratory Professional/Technician	3	3.7%	16	4.9%
Nurse	19	23.5%	37	11.2%
Physician	1	1.2%	1	0.3%
Policy/Planner	3	3.7%	5	1.5%
Public Relations/Media Specialist	3	3.7%	3	0.9%
Other	4	4.9%	12	3.6%
TOTAL	81		329	

